SRA Life, Earth, and Physical Science Laboratories
correlation to
Delaware Science Standards
Grades 6-8

SRA Life, Earth, and Physical Science Laboratories provide core science content in an alternate reading format. Each *SRA Science Lab* contains 180 Science Cards covering key science concepts and vocabulary. Each lab covers 90 different science topics presented at two different reading levels to meet varied student abilities. The *Teacher's Handbook* includes hands-on inquiry activities as well as vocabulary building exercises. The *Classroom Resource CD-ROM* includes Writing Strategies in Science along with tests and vocabulary games.

Science Standard 1: Nature and Application of Science and Technology
Strand: Understandings and Abilities of Scientific Inquiry
1. Understand that: Scientific investigations involve asking testable questions. Different kinds of questions suggest different scientific investigations. The current body of scientific knowledge guides the investigation.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 15

Science Standard 1: Nature and Application of Science and Technology
Strand: Understandings and Abilities of Scientific Inquiry
2. Understand that: A valid investigation controls variables. Different experimental designs and strategies can be developed to answer the same question.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 15, 23

Science Standard 1: Nature and Application of Science and Technology
Strand: Understandings and Abilities of Scientific Inquiry
3. Understand that: In a scientific investigation, data collection involves making precise measurements and keeping accurate records so that others can replicate the experiment.
Life Science Lab Teacher's Handbook: Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 22, 24

Science Standard 1: Nature and Application of Science and Technology
Strand: Understandings and Abilities of Scientific Inquiry
4. Understand that: There is much experimental and observational evidence that supports a large body of knowledge. The scientific community supports known information until new experimental evidence arises that does not match existing explanations. This leads to the evolution of the scientific body of knowledge.
Life Science Lab, Level A: Cards 46, 49, 64, 65, 66, 67, 69 **Life Science Lab, Level B:** Cards 46, 49, 64, 65, 66, 67, 69 **Earth Science Lab, Level A:** Cards 10, 30, 51, 54, 68, 72, 78 **Earth Science Lab, Level B:** Cards 10, 30, 51, 54, 68, 72, 78 **Physical Science Lab, Level A:** Cards 3, 7, 17, 34, 35, 53, 59 **Physical Science Lab, Level B:** Cards 3, 7, 17, 34, 35, 53, 59

Science Standard 1: Nature and Application of Science and Technology
Strand: Understandings and Abilities of Scientific Inquiry
5. Understand that: Evaluating the explanations proposed by others involves examining and comparing evidence, identifying faulty reasoning, pointing out statements that go beyond the evidence, and suggesting alternative observations for the same observations. Conflicting data or conflicting interpretations of the same data suggest the need for further investigation. Continued investigation can lead to greater understanding and resolution of the conflict.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Science Standard 1: Nature and Application of Science and Technology
Strand: Understandings and Abilities of Scientific Inquiry
6. Understand that: The scientific habits of mind and other sources of knowledge and skills are essential to scientific inquiry. Habits of mind include tolerance of ambiguity, skepticism, openness to new ideas, and objectivity. Other knowledge and skill include mathematics, reading, writing, and technology.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Science Standard 1: Nature and Application of Science and Technology
Strand: Science, Technology, and Society
1. Advances in technology can expand the body of scientific knowledge. Technological tools allow people to observe objects and phenomena that otherwise would not be possible. Technology enhances the quality, accuracy, speed and analysis of data gathered.
Life Science Lab, Level A: Cards 5, 49, 83 **Life Science Lab, Level B:** Cards 5, 49, 83 **Earth Science Lab, Level A:** Cards 16, 20, 31, 51, 54, 70, 79, 80, 81, 88 **Earth Science Lab, Level B:** Cards 16, 20, 31, 51, 54, 70, 79, 80, 81, 88 **Physical Science Lab, Level A:** Cards 81, 84, 90 **Physical Science Lab, Level B:** Cards 81, 84, 90

Science Standard 1: Nature and Application of Science and Technology
Strand: Science, Technology, and Society
2. Science and technology in society are driven by the following factors: economical, political, cultural, social, and environmental. Increased scientific knowledge and technology create changes that can be beneficial or detrimental to individuals or society through impact on human health and the environment.
Life Science Lab, Level A: Cards 46, 49, 64, 69, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 46, 49, 64, 69, 87, 88, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab, Level A:** Cards 16, 20, 37, 42, 51, 54, 59, 60, 61, 70, 79, 80, 81, 86, 88 **Earth Science Lab, Level B:** Cards 16, 20, 37, 42, 51, 54, 59, 60, 61, 70, 79, 80, 81, 86, 88 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?,* pages 89-91 **Physical Science Lab, Level A:** Cards 33, 35, 76, 81, 84, 90 **Physical Science Lab, Level B:** Cards 33, 35, 76, 81, 84, 90

Science Standard 1: Nature and Application of Science and Technology
Strand: History and Context of Science
1. Over the course of human history, contributions to science have been made by different people from different cultures. Studying some of these contributions and how they came about provides insight into the expansion of scientific knowledge.
Life Science Lab, Level A: Cards 2, 5, 46, 59 **Life Science Lab, Level B:** Cards 2, 5, 46, 59 **Earth Science Lab, Level A:** Cards 10, 68, 72, 78 **Earth Science Lab, Level B:** Cards 10, 68, 72, 78 **Physical Science Lab, Level A:** Cards 3, 7, 17, 55 **Physical Science Lab, Level B:** Cards 3, 7, 17, 55

Science Standard 2: Materials and Their Properties
Strand: Properties and Structure of Materials
1. All matter consists of particles too small to be seen with the naked eye. The arrangement, motion, and interaction of these particles determine the three states of matter (solid, liquid, and gas). Particles in all three states are in constant motion. In the solid state, tightly packed particles have a limited range of motion. In the liquid state, particles are loosely packed and move past each other. In the gaseous state, particles are free to move.
Physical Science Lab, Level A: Cards 3, 4, 5, 6, 7, 42 **Physical Science Lab, Level B:** Cards 3, 4, 5, 6, 7, 42

Science Standard 2: Materials and Their Properties
Strand: Properties and Structure of Materials
2. A phase change may occur when a material absorbs or releases heat energy. Changes in phase do not change the particles but do change how they are arranged.
Physical Science Lab, Level A: Cards 5, 6, 7, 8, 42 **Physical Science Lab, Level B:** Cards 5, 6, 7, 8, 42

Science Standard 2: Materials and Their Properties
Strand: Properties and Structure of Materials
3. Some physical properties, such as mass and volume, depend upon the amount of material. Other physical properties, such as density and melting point, are independent of the quantity of material. Density and melting point are unique properties for a material. Tools such as microscopes, scales, beakers, graduated cylinders, Celsius thermometers, and metric rulers are used to measure physical properties.
Physical Science Lab, Level A: Cards 1, 2, 42 **Physical Science Lab, Level B:** Cards 1, 2, 42

Science Standard 2: Materials and Their Properties
Strand: Properties and Structure of Materials
4. An important property of materials is their ability to conduct heat. Some materials, such as certain metals, are excellent conductors, while other materials, such as glass, are poor conductors (good thermal insulators).
Physical Science Lab, Level A: Card 43 **Physical Science Lab, Level B:** Card 43

Science Standard 2: Materials and Their Properties
Strand: Properties and Structure of Materials
5. Exposure to energy, such as light and heat, may change the physical properties of materials.
Physical Science Lab, Level A: Cards 5, 6, 7, 8, 42 **Physical Science Lab, Level B:** Cards 5, 6, 7, 8, 42

Science Standard 2: Materials and Their Properties
Strand: Mixtures and Solutions
1. Mixtures can be homogeneous or heterogeneous. Mixtures may be solids, liquids, and/or gases. Most materials are physical mixtures consisting of different components in varying concentrations. The individual components can be separated using the components' unique physical properties.
Physical Science Lab, Level A: Cards 12, 13 **Physical Science Lab, Level B:** Cards 12, 13

Science Standard 2: Materials and Their Properties
Strand: Mixtures and Solutions
2. Solutions are homogeneous mixtures of two or more components. The properties of a solution depend on the nature and concentration of the solute(s) and the nature of the solvent(s).
Physical Science Lab, Level A: Card 13 **Physical Science Lab, Level B:** Card 13

Science Standard 2: Materials and Their Properties
Strand: Mixtures and Solutions
3. The rate of solubility is influenced by temperature and the surface area of the solute.
Physical Science Lab, Level A: Card 13 **Physical Science Lab, Level B:** Card 13

Science Standard 2: Materials and Their Properties
Strand: Mixtures and Solutions
4. Temperature of the solvent can affect the saturation point of the solution.
Physical Science Lab, Level A: Card 13 **Physical Science Lab, Level B:** Card 13

Science Standard 2: Materials and Their Properties
Strand: Mixtures and Solutions
5. In mixtures, individual components move from areas of higher concentration to areas of lower concentration to eliminate concentration differences. Diffusion is the movement of individual components.
Life Science Lab, Level A: Card 8 **Life Science Lab, Level B:** Card 8 **Physical Science Lab, Level A:** Cards 12, 13 **Physical Science Lab, Level B:** Cards 12, 13

Science Standard 2: Materials and Their Properties
Strand: Conservation of Matter
1. The total mass of the mixture is equal to the sum of the masses of the components. Total mass is conserved when different substances are mixed.
Physical Science Lab, Level A: Cards 9, 12, 13 **Physical Science Lab, Level B:** Cards 9, 12, 13

Science Standard 2: Materials and Their Properties
Strand: Material Technology
1. Synthetic materials and/or modified natural materials are produced to make products used in everyday life.
Physical Science Lab, Level A: Cards 35, 38 **Physical Science Lab, Level B:** Cards 35, 38

Science Standard 2: Materials and Their Properties
Strand: Material Technology
2. The production of new materials has social, environmental, and other implications that require analyses of the risks and benefits.
Physical Science Lab, Level A: Card 35 **Physical Science Lab, Level B:** Card 35

Science Standard 3: Energy and Its Effects
Strand: The Forms and Sources of Energy
1. Energy from the Sun takes the form of electromagnetic waves such as infrared, visible, and ultraviolet electromagnetic waves. The radiation from the sun consists of a range of energies in the electromagnetic spectrum.
Physical Science Lab, Level A: Cards 46, 82, 83, 85 **Physical Science Lab, Level B:** Cards 46, 82, 83, 85

Science Standard 3: Energy and Its Effects
Strand: The Forms and Sources of Energy
2. Mechanical energy comes from the motion (kinetic energy) and position (potential energy) of objects. Gravitational potential energy and elastic potential energy are important forms of potential energy that contribute to the mechanical energy of objects.
Physical Science Lab, Level A: Cards 36, 37, 39, 40, 41 **Physical Science Lab, Level B:** Cards 36, 37, 39, 40, 41 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 3, *Energy Conversion*, pages 85-87

Science Standard 3: Energy and Its Effects
Strand: The Forms and Sources of Energy
3. Sound energy is the energy that takes the form of mechanical waves passing through objects or substances. The energy delivered by a wave in a given unit of time is determined by the amplitude and frequency of the wave.
Earth Science Lab Teacher's Handbook: Hands-On Activity 4, *Using Sound Waves*, pages 85-87 **Physical Science Lab, Level A:** Cards 77, 78, 79, 80, 81 **Physical Science Lab, Level B:** Cards 77, 78, 79, 80, 81 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 6, *Making Sound*, pages 97-99

Science Standard 3: Energy and Its Effects
Strand: The Forms and Sources of Energy
4. Heat energy comes from the random motion of the particles in an object or substance. Temperature is a measure of the motion of the particles. The higher the temperature of the material, the greater the motion of the particles.
Physical Science Lab, Level A: Cards 42, 43, 44 **Physical Science Lab, Level B:** Cards 42, 43, 44

Science Standard 3: Energy and Its Effects
Strand: The Forms and Sources of Energy
5. Electrical energy is a form of energy that can be transferred by moving charges through a complete circuit.
Physical Science Lab, Level A: Cards 66, 67, 68, 69, 70, 71, 72, 73 **Physical Science Lab, Level B:** Cards 66, 67, 68, 69, 70, 71, 72, 73 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 5, *Making a Potato Battery*, pages 93-95

Science Standard 3: Energy and Its Effects
Strand: Forces and the Transfer of Energy
1. When the forces acting on an object are balanced, its motion will not change. Unbalanced forces will cause the object's motion to change. Changes in motion depend upon the size and direction of the total unbalanced force exerted on the object.
Physical Science Lab, Level A: Cards 54, 55, 56, 58, 59 **Physical Science Lab, Level B:** Cards 54, 55, 56, 58, 59 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 4, *Reducing Friction*, pages 89-91

Science Standard 3: Energy and Its Effects
Strand: Forces and the Transfer of Energy
2. Gravity is a force that acts between masses over very large distances. Near the Earth's surface, gravity pulls objects and substances vertically downward.
Physical Science Lab, Level A: Cards 57, 59 **Physical Science Lab, Level B:** Cards 57, 59

Science Standard 3: Energy and Its Effects
Strand: Forces and the Transfer of Energy
3. Forces can be used to transfer energy from one object to another. Simple machines are used to transfer energy in order to simplify difficult tasks.
Physical Science Lab, Level A: Cards 54, 63, 64 **Physical Science Lab, Level B:** Cards 54, 63, 64

Science Standard 3: Energy and Its Effects
Strand: Forces and the Transfer of Energy
4. When energy from the sun is transferred to objects and substances, it can be transformed into a variety of energy forms.
Life Science Lab, Level A: Cards 16, 17 **Life Science Lab, Level B:** Cards 16, 17 **Earth Science Lab, Level A:** Cards 38, 40, 41, 45, 46, 47, 55, 59, 60, 61, 87 **Earth Science Lab, Level B:** Cards 38, 40, 41, 45, 46, 47, 55, 59, 60, 61, 87 **Physical Science Lab, Level A:** Cards 43, 44, 46, 47, 82, 83, 85 **Physical Science Lab, Level B:** Cards 43, 44, 46, 47, 82, 83, 85

Science Standard 3: Energy and Its Effects
Strand: Forces and the Transfer of Energy
5. Light energy radiates from a source and travels in straight lines. Light is reflected, refracted, transmitted, and absorbed differently by different materials. To see an object, light energy emitted or reflected from the object must enter the eye.
Physical Science Lab, Level A: Cards 85, 86, 87, 88, 89 **Physical Science Lab, Level B:** Cards 85, 86, 87, 88, 89

Science Standard 3: Energy and Its Effects
Strand: Forces and the Transfer of Energy
6. The addition or removal of heat energy from a material changes its temperature or its physical state.
Physical Science Lab, Level A: Cards 6, 7, 8, 42 **Physical Science Lab, Level B:** Cards 6, 7, 8, 42

Science Standard 3: Energy and Its Effects
Strand: Forces and the Transfer of Energy
7. Heat energy is transported by conduction, convection, and radiation. Heat energy transfers from warmer substances to cooler substances until they reach the same temperature.
Earth Science Lab, Level A: Card 38 **Earth Science Lab, Level B:** Card 38 **Physical Science Lab, Level A:** Cards 42, 43, 44 **Physical Science Lab, Level B:** Cards 42, 43, 44

Science Standard 3: Energy and Its Effects
Strand: Forces and the Transfer of Energy
8. Electrical systems can be designs to perform a variety of tasks. Series or parallel circuits can be used to transfer electrical energy to devices. Electrical circuits require a complete loop through which the electrical charges can pass.
Physical Science Lab, Level A: Cards 66, 67, 68, 69, 70, 71, 72, 73 **Physical Science Lab, Level B:** Cards 66, 67, 68, 69, 70, 71, 72, 73 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 5, *Making a Potato Battery*, pages 93-95

Science Standard 3: Energy and Its Effects
Strand: Forces and the Transfer of Energy
9. Moving electric charges produce magnetic fields.
Physical Science Lab, Level A: Cards 66, 76 **Physical Science Lab, Level B:** Cards 66, 76

Science Standard 3: Energy and Its Effects
Strand: Energy Interacting with Materials: The Transformation and Conservation of Energy
1. Energy can be transformed from one form to another. Energy transformations often take place while energy is being transferred to another object or substance. Energy transformations and energy transfers can be used to explain how energy flows through a physical system (e.g., photosynthesis, weathering, electrical circuits).
Life Science Lab, Level A: Cards 9, 13, 17, 76 **Life Science Lab, Level B:** Cards 9, 13, 17, 76 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99 **Earth Science Lab, Level A:** Cards 15, 17, 22, 38, 39, 40, 41, 52, 53, 54, 87 **Earth Science Lab, Level B:** Cards 15, 17, 22, 38, 39, 40, 41, 52, 53, 54, 87 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 6, *Modeling a Tornado*, pages 93-95 **Physical Science Lab, Level A:** Cards 6, 7, 8, 9, 27, 28, 29, 30, 34, 36, 37, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 66, 67, 68, 70, 76, 77, 78, 70, 82, 83 **Physical Science Lab, Level B:** Cards 6, 7, 8, 9, 27, 28, 29, 30, 34, 36, 37, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 66, 67, 68, 70, 76, 77, 78, 70, 82, 83 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 2, *Chemical Reaction Rates*, pages 81-83; Hands-On Activity 3, *Energy Conversion*, pages 85-87; Hands-On Activity 5, *Making a Potato Battery*, pages 93-95; Hands-On Activity 6, *Making Sound*, pages 97-99

Science Standard 3: Energy and Its Effects
Strand: Energy Interacting with Materials: The Transformation and Conservation of Energy
2. When a substance absorbs heat energy, or when a different form of energy is absorbed by the substance and is transformed into heat energy, the substance usually expands. The particles within the substance do not expand but the space between the particles increases.
Physical Science Lab, Level A: Cards 6, 7, 8, 9, 27, 28, 30, 42, 43, 44 **Physical Science Lab, Level B:** Cards 6, 7, 8, 9, 27, 28, 30, 42, 43, 44 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 2, *Chemical Reaction Rates*, pages 81-83

Science Standard 3: Energy and Its Effects
Strand: Energy Interacting with Materials: The Transformation and Conservation of Energy
3. Materials may absorb some frequencies of light but not others. The selective absorption of different wavelengths of white light determines the color of most objects.
Physical Science Lab, Level A: Cards 85, 89 **Physical Science Lab, Level B:** Cards 85, 89

Science Standard 3: Energy and Its Effects
Strand: The Production, Consumption, and Application of Energy
1. Energy sources can be renewable or finite. Most energy used by industrial societies is derived from fossil fuel sources. Such sources are inherently limited on the Earth and are unevenly distributed geographically. Renewable energy sources vary in their availability and ease of use.
Life Science Lab, Level A: Card 84 **Life Science Lab, Level B:** Card 84 **Earth Science Lab, Level A:** Cards 35, 90 **Earth Science Lab, Level B:** Cards 35, 90 **Physical Science Lab, Level A:** Cards 34, 38, 46, 47, 48, 49 **Physical Science Lab, Level B:** Cards 34, 38, 46, 47, 48, 49

Science Standard 3: Energy and Its Effects
Strand: The Production, Consumption, and Application of Energy
2. Technological advances throughout history have led to the discovery and use of different forms of energy, and to more efficient use of all forms of energy. These technological advances have led to increased demand for energy and have had both beneficial and detrimental effects on society.
Life Science Lab, Level A: Card 84 **Life Science Lab, Level B:** Card 84 **Earth Science Lab, Level A:** Cards 35, 90 **Earth Science Lab, Level B:** Cards 35, 90 **Physical Science Lab, Level A:** Cards 34, 38, 46, 47, 48, 49, 72, 73, 81, 84 **Physical Science Lab, Level B:** Cards 34, 38, 46, 47, 48, 49, 72, 73, 81, 84

Science Standard 3: Energy and Its Effects
Strand: The Production, Consumption, and Application of Energy
3. Responsible use of energy requires consideration of energy available, efficiency of its use, the environmental impact, and possible alternate sources.
Life Science Lab, Level A: Cards 84, 89, 90 **Life Science Lab, Level B:** Cards 84, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain*, pages 101-103 **Earth Science Lab, Level A:** Cards 35, 42, 59, 61, 86, 90 **Earth Science Lab, Level B:** Cards 35, 42, 59, 61, 86, 90 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?*, pages 89-91 **Physical Science Lab, Level A:** Cards 34, 38, 46, 47, 48, 49 **Physical Science Lab, Level B:** Cards 34, 38, 46, 47, 48, 49

Science Standard 4: Earth in Space
Strand: The Earth/Moon/Sun System
1. The Sun is a star that gives off radiant energy that drives Earth systems and is essential for life. The amount of radiant energy Earth receives from the sun throughout the year is nearly constant.
Life Science Lab, Level A: Cards 16, 17 **Life Science Lab, Level B:** Cards 16, 17 **Earth Science Lab, Level A:** Cards 55, 62, 67 **Earth Science Lab, Level B:** Cards 55, 62, 67

Science Standard 4: Earth in Space
Strand: The Earth/Moon/Sun System
2. The tilt of Earth's axis of rotation as it orbits the Sun points in the same direction with respect to the stars. The tilt and the orbital motion of Earth around the Sun causes variation in the amount of solar energy striking a location on the Earth's surface which results in variation in the length of day/night and seasons.
Earth Science Lab, Level A: Cards 55, 62 **Earth Science Lab, Level B:** Cards 55, 62

Science Standard 4: Earth in Space
Strand: The Earth/Moon/Sun System
3. Moon phases occur because the relative positions of Earth, Moon, and Sun change, thereby enabling us to see different amounts of the Moon's surface.
Earth Science Lab, Level A: Card 64 **Earth Science Lab, Level B:** Card 64

Science Standard 4: Earth in Space
Strand: The Earth/Moon/Sun System
4. The Moon is a natural satellite of Earth and is different than the Earth in size, atmosphere, gravity, and surface features.
Earth Science Lab, Level A: Card 63 **Earth Science Lab, Level B:** Card 63

Science Standard 4: Earth in Space
Strand: The Earth/Moon/Sun System
5. Tides are caused by the gravitational interactions of the Sun, Moon and Earth. The Moon has a greater impact on tides because of its proximity to Earth.
Earth Science Lab, Level A: Cards 66, 90 **Earth Science Lab, Level B:** Cards 66, 90 **Physical Science Lab, Level A:** Card 48 **Physical Science Lab, Level B:** Card 48

Science Standard 4: Earth in Space
Strand: The Solar System
1. The Sun is by far the most massive object in the Solar System, therefore gravitationally dominating all other members of the Solar System.
Earth Science Lab, Level A: Cards 67, 68 **Earth Science Lab, Level B:** Cards 67, 68 **Physical Science Lab, Level A:** Card 59 **Physical Science Lab, Level B:** Card 59

Science Standard 4: Earth in Space
Strand: The Solar System
2. The Solar System consists of comets, asteroids, planets, and their respective satellites, most of which orbit the Sun on a plane called the ecliptic. The planets in our Solar System revolve in the same direction around the Sun in elliptical orbits that are very close to being in the same plane. Most planets rotate in the same direction with respect to the Sun.
Earth Science Lab, Level A: Cards 67, 68, 69, 70, 71, 72, 73 **Earth Science Lab, Level B:** Cards 67, 68, 69, 70, 71, 72, 73 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99

Science Standard 4: Earth in Space
Strand: The Solar System
3. Planets can be categorized as inner or outer planets according to density, diameter and surface features.
Earth Science Lab, Level A: Cards 69, 70, 71, 72 **Earth Science Lab, Level B:** Cards 69, 70, 71, 72

Science Standard 4: Earth in Space
Strand: The Solar System
4. Planets and their moons have been shaped over time by common processes such as catering, volcanism, erosion, and tectonics. The presence of life on a planet can contribute to its unique development.
Earth Science Lab, Level A: Cards 63, 68, 69, 70, 71, 72, 73 **Earth Science Lab, Level B:** Cards 63, 68, 69, 70, 71, 72, 73

Science Standard 4: Earth in Space
Strand: Technology and Applications
5. Technology, including humans landing on the Moon, robot landers and other space probes, satellites, and radio telescopes, allow scientists to investigate conditions on Earth and other objects in the Solar System.
Earth Science Lab, Level A: Cards 70, 79, 80, 81 **Earth Science Lab, Level B:** Cards 70, 79, 80, 81

Science Standard 4: Earth in Space
Strand: Technology and Applications
2. The technology used in space exploration expands our knowledge of the Universe and has many spin-offs related to everyday applications.
Earth Science Lab, Level A: Cards 20, 70, 79, 80, 81, 88 **Earth Science Lab, Level B:** Cards 20, 70, 79, 80, 81, 88

Science Standard 5: Earth's Dynamic Systems
Strand: Components of Earth
1. Water exists on the Earth in reservoirs (on or within the Earth's surface and atmosphere). The total amount of water in these reservoirs does not change, however, the ratio of water in solid, liquid, or gaseous form varies over time and location.
Earth Science Lab, Level A: Cards 82, 83, 84, 87 **Earth Science Lab, Level B:** Cards 82, 83, 84, 87 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 8, *Temperature, Salinity, and Water Density*, pages 101-103

Science Standard 5: Earth's Dynamic Systems
Strand: Components of Earth
2. The movement of water among the geosphere, hydrosphere and atmosphere affects such things as weather systems, ocean currents, and global climate.
Earth Science Lab, Level A: Cards 43, 44, 45, 46, 47, 48, 49, 52, 53, 54, 55, 56, 58, 82, 83, 84, 87 **Earth Science Lab, Level B:** Cards 43, 44, 45, 46, 47, 48, 49, 52, 53, 54, 55, 56, 58, 82, 83, 84, 87 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 6, *Modeling a Tornado*, pages 93-95; Hands-On Activity 8, *Temperature, Salinity, and Water Density*, pages 101-103

Science Standard 5: Earth's Dynamic Systems
Strand: Components of Earth
3. The formation of sediment and soil requires a long period of time as rocks are weathered, eroded, and deposited.
Earth Science Lab, Level A: Cards 22, 23, 25, 27, 28, 29 **Earth Science Lab, Level B:** Cards 22, 23, 25, 27, 28, 29

Science Standard 5: Earth's Dynamic Systems
Strand: Components of Earth
4. The atmosphere is a mixture having as its principle components a fixed ration of nitrogen and oxygen and, depending on the location, variable amounts of carbon dioxide, water vapor, and dust particles.
Earth Science Lab, Level A: Cards 36, 37 **Earth Science Lab, Level B:** Cards 36, 37

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
1. Water cycles from one reservoir to another through the processes of evaporation, transpiration, condensation and precipitation. Energy transfers and/or transformations are associated with each of these processes.
Earth Science Lab, Level A: Cards 47, 48, 49 **Earth Science Lab, Level B:** Cards 47, 48, 49

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
2. Weather within a watershed travels over and through the land at various speeds based on the rate of change in elevation and the permeability and porosity of the soil. Water carries with it products of human activity.
Life Science Lab, Level A: Card 90 **Life Science Lab, Level B:** Card 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain*, pages 101-103 **Earth Science Lab, Level A:** Cards 25, 59, 82, 83, 84, 86, 87 **Earth Science Lab, Level B:** Cards 25, 59, 82, 83, 84, 86, 87

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
3. Surface water always flows downhill. Areas of higher elevation separate watersheds. In Delaware, this water eventually reaches the Delaware Rive, the Delaware Bay, the Atlantic Ocean or the Chesapeake Bay.
Earth Science Lab, Level A: Card 25 **Earth Science Lab, Level B:** Card 25

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
4. Constructive processes that build up on the land and the destructive processes of weathering and erosion shape and reshape the land surface. The height of Earth landforms is a result of the difference between the rate of uplift and the rate of erosion at a particular location.
Earth Science Lab, Level A: Cards 9, 10, 11, 12, 13, 14, 15, 17, 21, 22, 24, 25, 26, 27, 28 **Earth Science Lab, Level B:** Cards 9, 10, 11, 12, 13, 14, 15, 17, 21, 22, 24, 25, 26, 27, 28 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 2, *Plate Boundaries in Action*, pages 77-79

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
5. Some Earth events such as El Niño, volcanism and global warming can affect the entire Earth system and are likely the result of complex interactions among Earth spheres.
Earth Science Lab, Level A: Cards 15, 17, 37, 59, 60, 61 **Earth Science Lab, Level B:** Cards 15, 17, 37, 59, 60, 61

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
6. The atmosphere has properties that can be observed, measured, and used to predict changes in weather and to identify climatic patterns.
Earth Science Lab, Level A: Cards 36, 37, 38, 39, 40, 41 **Earth Science Lab, Level B:** Cards 36, 37, 38, 39, 40, 41

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
7. The climate at a location on Earth is the result of several interacting variables such as latitude, altitude and/or proximity to water.
Earth Science Lab, Level A: Cards 55, 56, 57, 58, 59, 60, 61, 62 **Earth Science Lab, Level B:** Cards 55, 56, 57, 58, 59, 60, 61, 62

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
8. Energy from the Sun heats Earth unevenly causing pressure differences and air movements (convection currents) resulting in changing weather patterns.
Earth Science Lab, Level A: Cards 38, 39, 40, 41, 43, 45, 46, 52, 53, 54, 57, 58, 87 **Earth Science Lab, Level B:** Cards 38, 39, 40, 41, 43, 45, 46, 52, 53, 54, 57, 58, 87 **Physical Science Lab, Level A:** Cards 44, 47 **Physical Science Lab, Level B:** Cards 44, 47

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
9. Ocean currents, global winds, and storm systems, redistribute heat energy on Earth's surface and therefore affect weather patterns of a region.
Earth Science Lab, Level A: Cards 38, 40, 41, 52, 53, 54, 87 **Earth Science Lab, Level B:** Cards 38, 40, 41, 52, 53, 54, 87

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
10. Uneven heating and cooling of the Earth's surface produces masses that differ in density, humidity and temperature. The interaction of these air masses results in significant weather changes.
Earth Science Lab, Level A: Cards 45, 46, 52, 53, 54 **Earth Science Lab, Level B:** Cards 45, 46, 52, 53, 54

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
11. Past geological events and environments can be reconstructed by interpreting fossilized remains and successive layering of sedimentary rocks.
Life Science Lab, Level A: Card 67 **Life Science Lab, Level B:** Card 67 **Earth Science Lab, Level A:** Cards 30, 33, 34 **Earth Science Lab, Level B:** Cards 30, 33, 34

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
12. The fit of continental coastlines, the similarity of rock types and fossilized remains provide evidence that today's continents were once a single land mass. The continents moved to their current positions on plates driven by energy from Earth's interior.
Earth Science Lab, Level A: Cards 10, 11, 12, 30, 34 **Earth Science Lab, Level B:** Cards 10, 11, 12, 30, 34

Science Standard 5: Earth's Dynamic Systems
Strand: Interactions Throughout Earth's Systems
13. Heat energy stored in the oceans and transferred by currents influence climate. A disruption of the circulation and temperature of the world's oceans would foster climate change and have environmental and economic consequences.
Earth Science Lab, Level A: Cards 40, 55, 56, 57, 58, 60, 61, 87 **Earth Science Lab, Level B:** Cards 40, 55, 56, 57, 58, 60, 61, 87

Science Standard 5: Earth's Dynamic Systems
Strand: Technology and Applications
1. Global weather data from ground measurements, satellites and radar are recorded on maps, analyzed, and used to predict local weather.
Earth Science Lab, Level A: Cards 39, 40, 41, 43, 44, 45, 46, 48, 49, 50, 51 **Earth Science Lab, Level B:** Cards 39, 40, 41, 43, 44, 45, 46, 48, 49, 50, 51

Science Standard 5: Earth's Dynamic Systems
Strand: Technology and Applications
2. Water from some natural sources is unfit to drink and requires the use of specialized technology to analyze and purify it.
Life Science Lab, Level A: Cards 84, 90 **Life Science Lab, Level B:** Cards 84, 90 **Earth Science Lab, Level A:** Card 86 **Earth Science Lab, Level B:** Card 86

Science Standard 6: Life Processes
Strand: Structure/Function Relationship
1. Living organisms share common characteristics that distinguish them from non-living, dead, and dormant things. They grow, consume nutrients, exchange gases, respond to stimuli, reproduce, need water, eliminate waste, and are composed of cell(s).
Life Science Lab, Level A: Cards 1, 5, 6, 7, 8, 9, 10 **Life Science Lab, Level B:** Cards 1, 5, 6, 7, 8, 9, 10 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells,* pages 77-79

Science Standard 6: Life Processes
Strand: Structure/Function Relationship
2. Living systems in all kingdoms demonstrate the complementary nature of structure and function. Important levels or organization for structure and function include cells, tissues, organs, organ systems, and organisms.
Life Science Lab, Level A: Cards 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 44 **Life Science Lab, Level B:** Cards 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 27, 28,2 9, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 44 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87

Science Standard 6: Life Processes
Strand: Structure/Function Relationship
3. Most organisms are single celled while others are multi-cellular. Multi-cellular organisms consist of individual cells that cannot survive independently, while single-celled organisms are composed of one cell that can survive independently.
Life Science Lab, Level A: Cards 6, 7, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 27, 28,2 9, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 44 **Life Science Lab, Level B:** Cards 6, 7, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 44 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87

Science Standard 6: Life Processes
Strand: Structure/Function Relationship
4. The cell is the fundamental unit of life. Cells have basic needs for survival. They use energy, consume materials, require water, eliminate waste, and reproduce.
Life Science Lab, Level A: Cards 5, 6, 7, 8, 9, 10 **Life Science Lab, Level B:** Cards 5, 6, 7, 8, 9, 10 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells,* pages 77-79

Science Standard 6: Life Processes
Strand: Structure/Function Relationship
5. Most cells contain a set of observable structures called organelles which allow them to carry out life processes. Major organelles include vacuoles, cell membrane, nucleus, and mitochondria. Plant cells have a cell wall and chloroplasts.
Life Science Lab, Level A: Cards 5, 6, 7, 8, 9 **Life Science Lab, Level B:** Cards 5, 6, 7, 8, 9 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells,* pages 77-79

Science Standard 6: Life Processes
Strand: Structure/Function Relationship
6. The human body has systems that perform functions necessary for life. Major systems of the human body include the digestive, respiratory, reproductive, and circulatory systems.
Life Science Lab, Level A: Cards 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58 **Life Science Lab, Level B:** Cards 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58 **Life Science Lab Teacher's Handbook:** Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91

Science Standard 6: Life Processes
Strand: Matter and Energy Transformations
1. All organisms require energy. A general distinction among organisms is that plants use solar energy to make their own food (sugar) and animals require energy directly or indirectly from plants.
Life Science Lab, Level A: Cards 1, 9, 16, 17, 76, 77 **Life Science Lab, Level B:** Cards 1, 9, 16, 17, 76, 77

Science Standard 6: Life Processes
Strand: Matter and Energy Transformations
2. Plants use the energy from sunlight, carbon dioxide, and water to produce sugars (photosynthesis). Plants can use the food (sugar) immediately or store it for later use.
Life Science Lab, Level A: Cards 16, 17, 76 **Life Science Lab, Level B:** Cards 16, 17, 76

Science Standard 6: Life Processes
Strand: Matter and Energy Transformations
3. Most living things use sugar (from food) and oxygen to release the energy needed to carry out life processes (cellular respiration). Other materials from food are used for building and repairing cell parts.
Life Science Lab, Level A: Cards 1, 9, 16, 17, 76, 77 **Life Science Lab, Level B:** Cards 1, 9, 16, 17, 76, 77

Science Standard 6: Life Processes
Strand: Regulation and Behavior
1. Regulation of an organism's internal environment involves sensing external changes in the environment and responding physiologically to keep conditions within the range required for survival (e.g., increasing heart rate with exertion).
Life Science Lab, Level A: Cards 44, 47, 51, 54, 55, 56 **Life Science Lab, Level B:** Cards 44, 47, 51, 54, 55, 56 **Life Science Lab Teacher's Handbook:** Hands-On Activity 4, *Your Cardiovascular System*, pages 89-91

Science Standard 6: Life Processes
Strand: Life Processes and Technology Application
1. Technological advances in medicine and improvements in hygiene have helped in the prevention and treatment of illness.
Life Science Lab, Level A: Cards 45, 46, 47, 48, 49, 51, 53, 55, 57 **Life Science Lab, Level B:** Cards 45, 46, 47, 48, 49, 51, 53, 55, 57

Science Standard 6: Life Processes
Strand: Life Processes and Technology Application
2. The functioning and health of organisms are influenced by many factors (i.e., heredity, diet, lifestyle, bacteria, viruses, parasites, and the environment. Certain body structures and systems function to protect against disease and injury.
Life Science Lab, Level A: Cards 45, 46, 47, 48, 49, 56, 57 **Life Science Lab, Level B:** Cards 45, 46, 47, 48, 49, 56, 57

Science Standard 6: Life Processes
Strand: Life Processes and Technology Application
3. The environment may contain dangerous levels of substances in the water and soil that are harmful to organisms. Careful monitoring of these is important for healthy life processes.
Life Science Lab, Level A: Cards 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 87, 88, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain*, pages 101-103 **Earth Science Lab, Level A:** Cards 37, 42, 59, 60, 61, 86 **Earth Science Lab, Level B:** Cards 37, 42, 59, 60, 61, 86 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?*, pages 89-91

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
1. Reproduction is a characteristic of all living systems and is essential to the continuation of every species.
Life Science Lab, Level A: Cards 1, 58, 60, 61 **Life Science Lab, Level B:** Cards 1, 58, 60, 61

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
2. Some organisms reproduce asexually involving one parent. Asexual reproduction results in offspring that are genetically identical to the parent organism (clone). This process is advantageous in maintaining the genetic make-up of organisms that are successful in a specific environment.
Life Science Lab, Level A: Card 60 **Life Science Lab, Level B:** Card 60

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
3. Some organisms reproduce sexually involving two parents. Sexual reproduction results in offspring that have greater genetic diversity than those resulting from asexual reproduction. One-half of the offspring's genetic information come from the "male" parent and one-half comes from the "female" parent. These genetic differences help to endure survival of offspring in varied environments.
Life Science Lab, Level A: Cards 58, 61, 62, 63, 64 **Life Science Lab, Level B:** Cards 58, 61, 62, 63, 64

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
4. In sexual reproduction after the egg is fertilized, each of the new cells in the developing organism receives an exact copy of the genetic information contained in the nucleus of a fertilized egg.
Life Science Lab, Level A: Cards 58, 61 **Life Science Lab, Level B:** Cards 58, 61

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
5. Organism have different reproductive strategies to ensure their offspring's survival. Some organisms produce many offspring and provide little parental care. Other organisms produce few offspring and invest much time and energy in care of their offspring.
Life Science Lab, Level A: Cards 40, 58, 60, 61 **Life Science Lab, Level B:** Cards 40, 58, 60, 61

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
6. Chromosomes are found in the nucleus of the cell and contain genes that are made of DNA. Inherited traits of individuals are controlled by genes.
Life Science Lab, Level A: Cards 10, 58, 62, 63, 64 **Life Science Lab, Level B:** Cards 10, 58, 62, 63, 64

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
7. Chromosomes can be arranged in pairs (one-half of each pair from each parent). These pairs are approximately the same size and shape, and have similar sequences of genes. Human have 23 pairs (46) of chromosomes. Other organisms may have different numbers of chromosomes.
Life Science Lab, Level A: Cards 58, 61, 62, 63, 64 **Life Science Lab, Level B:** Cards 58, 61, 62, 63, 64

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
8. In humans, gender is determined by a pair of sex chromosomes. Females possess two X chromosomes; males an X and a Y chromosome. The sex of an embryo is determined by the sex chromosome found in the sperm cell.
Life Science Lab, Level A: Cards 58, 61, 62, 63 **Life Science Lab, Level B:** Cards 58, 61, 62, 63

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
9. Alternative versions of genes (different alleles) account for variations in inherited characteristics (i.e., flower color). Pairs of chromosomes that have the same allele present on both chromosomes are homozygous. Pairs of chromosomes with different alleles are heterozygous.
Life Science Lab, Level A: Cards 62, 63, 64 **Life Science Lab, Level B:** Cards 62, 63, 64

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
10. A dominant trait will be expressed if the organism is heterozygous or homozygous for the trait. A recessive trait will only be expressed if the organism is homozygous for the trait.
Life Science Lab, Level A: Cards 62, 63 **Life Science Lab, Level B:** Cards 62, 63

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
11. Mendelian genetics can be used to predict genotypes and phenotypes of offspring resulting from sexual reproduction.
Life Science Lab, Level A: Cards 62, 63 **Life Science Lab, Level B:** Cards 62, 63

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
1. The Earth's present day species evolved from earlier distinctly different species. Many thousands of layers of sedimentary tock provide evidence for the long history of the Earth and for the long history of changing life forms whole remains are found in the rocks. More recently deposited rock layers are more likely to contain fossils resembling existing species.
Life Science Lab, Level A: Cards 65, 66, 67, 68 **Life Science Lab, Level B:** Cards 65, 66, 67, 68 **Earth Science Lab, Level A:** Cards 33, 34 **Earth Science Lab, Level B:** Cards 33, 34

Science Standard 7: Diversity and Continuity of Living Things
Strand: Reproduction, Heredity and Development
2. Natural selection is the process by which some individuals with certain traits are more likely to survive and produce greater numbers of offspring than other organisms of the same species. Competition for resources and mates and conditions in the environment can affect which individual survive, reproduce and pass their traits on to future generations.
Life Science Lab, Level A: Cards 65, 66 **Life Science Lab, Level B:** Cards 65, 66

Science Standard 7: Diversity and Continuity of Living Things
Strand: Diversity and Evolution
3. Small genetic differences between parents and offspring accumulate over many generations, and ultimately new species may arise.
Life Science Lab, Level A: Cards 64, 65, 66 **Life Science Lab, Level B:** Cards 64, 65, 66

Science Standard 7: Diversity and Continuity of Living Things
Strand: Diversity and Evolution
4. Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival. Most of the species that have lived on Earth no longer exist.
Life Science Lab, Level A: Cards 67, 86 **Life Science Lab, Level B:** Cards 67, 86

Science Standard 7: Diversity and Continuity of Living Things
Strand: Diversity and Evolution
5. There is a wide diversity of organisms on Earth. These organisms may be classified in a number of ways. One classification system places organisms into five kingdoms (monera, protista, fungi, plantae, animalia) based on similarities in structure.
Life Science Lab, Level A: Cards 2, 3, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 86 **Life Science Lab, Level B:** Cards 2, 3, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 86 **Life Science Lab Teacher's Handbook:** Hands-On Activity 2, *Culturing Bacteria*, pages 81-83; Hands-On Activity 3, *Investigating Arthropods*, pages 85-87

Science Standard 7: Diversity and Continuity of Living Things
Strand: Diversity and Evolution
6. The great variety of body forms and structures found in different species enable organisms to survive in diverse environments.
Life Science Lab, Level A: Cards 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43 **Life Science Lab, Level B:** Cards 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43 **Life Science Lab Teacher's Handbook:** Hands-On Activity 2, *Culturing Bacteria*, pages 81-83; Hands-On Activity 3, *Investigating Arthropods*, pages 85-87

Science Standard 7: Diversity and Continuity of Living Things
Strand: Technology Applications
1. Selective breeding is used to cultivate plants and domesticated animals with desirable traits.
Life Science Lab, Level A: Card 69 **Life Science Lab, Level B:** Card 69

Science Standard 7: Diversity and Continuity of Living Things
Strand: Technology Applications
2. Knowledge gained from research in genetics is being applied to areas of human health. Geneticists and genetic counselors may use pedigrees and Punnett squares to help predict the possibility of genetic disorders in future generations.
Life Science Lab, Level A: Cards 64, 69 **Life Science Lab, Level B:** Cards 64, 69

Science Standard 8: Ecology
Strand: Interactions within the Environment
1. All populations living together (biotic factors) and the physical factors with which they interact (abiotic factors) compose an ecosystem.
Life Science Lab, Level A: Cards 70, 71, 72, 81, 82 **Life Science Lab, Level B:** Cards 70, 71, 72, 81, 82

Science Standard 8: Ecology
Strand: Interactions within the Environment
2. Ecosystems do not have precise boundaries. All ecosystems ultimately exchange materials with one another and all influence one another.
Life Science Lab, Level A: Cards 70, 71, 72, 81, 82 **Life Science Lab, Level B:** Cards 70, 71, 72, 81, 82

Science Standard 8: Ecology
Strand: Interactions within the Environment
3. The Delaware Estuary is a semi-enclosed tidal body of water with a free connection to the ocean. This richly productive system, including the associated marches, provides a variety of habitats for diverse species. This system is biologically and economically important.
Life Science Lab, Level A: Cards 82, 85, 90 **Life Science Lab, Level B:** Cards 82, 85, 90 **Earth Science Lab, Level A:** Cards 82, 83, 87, 89, 90 **Earth Science Lab, Level B:** Cards 82, 83, 87, 89, 90

Science Standard 8: Ecology
Strand: Interactions within the Environment
4. A population consists of all individuals of a species that occur together at a given place and time. A species is a distinct biological grouping of organisms whose members interbreed in nature and produce fertile offspring.
Life Science Lab, Level A: Card 1 **Life Science Lab, Level B:** Card 1

Science Standard 8: Ecology
Strand: Interactions within the Environment
5. The size of populations may change as a result of the interrelationships among organisms, These may include predator/prey ratios, availability of resources, and habitat changes.
Life Science Lab, Level A: Cards 72, 73, 74, 75, 76 **Life Science Lab, Level B:** Cards 72, 73, 74, 75, 76

Science Standard 8: Ecology
Strand: Interactions within the Environment
6. In all environments organisms with similar needs may compete with one another for resources including food, water, air, space and shelter. This competition results in natural population fluctuations.
Life Science Lab, Level A: Cards 72, 75 **Life Science Lab, Level B:** Cards 72, 75

Science Standard 8: Ecology
Strand: Interactions within the Environment
7. Overpopulation can lead to depletion of resources and potential extinction of species.
Life Science Lab, Level A: Cards 72, 75 **Life Science Lab, Level B:** Cards 72, 75

Science Standard 8: Ecology
Strand: Interactions within the Environment
8. Organisms within an ecosystem may interact symbiotically through mutualisms, parasitism, and commensalisms.
Life Science Lab, Level A: Card 74 **Life Science Lab, Level B:** Card 74

Science Standard 8: Ecology
Strand: Energy Flow and Material Cycles in the Environment
1. In most ecosystems, energy enters as sunlight and is transformed by producers into a biologically usable form of matter through photosynthesis. That matter and energy then passes from organism to organism through food webs. Some energy is released from the system as heat.
Life Science Lab, Level A: Cards 9, 13, 16, 17, 76, 77 **Life Science Lab, Level B:** Cards 9, 13, 16, 17, 76, 77 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99

Science Standard 8: Ecology
Strand: Energy Flow and Material Cycles in the Environment
2. Over time, matter is transferred repeatedly from one organism to another and between organisms and their physical environment. As in all material systems, the total amount of matter remains constant, even though its form and location change.
Life Science Lab, Level A: Cards 13, 76, 77, 78 **Life Science Lab, Level B:** Cards 13, 76, 77, 78

Science Standard 8: Ecology
Strand: Energy Flow and Material Cycles in the Environment
3. All organisms, including humans, are part of and depend on food webs. Food webs recycle matter continuously as organisms are decomposed after death to return food materials to the environment where it re-enters a food web.
Life Science Lab, Level A: Cards 13, 76, 77, 78 **Life Science Lab, Level B:** Cards 13, 76, 77, 78

Science Standard 8: Ecology
Strand: Human Impact
1. Humans can alter the biotic and abiotic factors within an ecosystem thereby creating changes to the overall system.
Life Science Lab, Level A: Cards 84, 85, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 84, 85, 86, 87, 88, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab, Level A:** Cards 37, 42, 59, 60, 61, 86 **Earth Science Lab, Level B:** Cards 37, 42, 59, 60, 61, 86 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?,* pages 89-91

Science Standard 8: Ecology
Strand: Human Impact
2. The introduction of competing species, removal of natural habitat, alteration of native landscapes due to urban, industrial, and agricultural activities, over-harvesting of species, alteration of waterways, and removal of natural predators, etc., are actions that have a lasting impact on ecosystems.
Life Science Lab, Level A: Cards 84, 86, 87, 88 **Life Science Lab, Level B:** Cards 84, 86, 87, 88

Science Standard 8: Ecology
Strand: Human Impact
3. Individuals and policymakers make decisions regarding the use of resources based on estimated personal and societal benefits and risks. Impacts on environmental systems result from these decisions.
Life Science Lab, Level A: Cards 84, 85, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 84, 85, 86, 87, 88, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab, Level A:** Cards 35, 37, 42, 59, 60, 61, 85, 86 **Earth Science Lab, Level B:** Cards 35, 37, 42, 59, 60, 61, 85, 86 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?,* pages 89-91